

More than ability: Teachers' perspectives on how student attitudes shape mathematics achievement

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Abstract

This study explores the influence of student attitudes towards mathematics on their academic performance, from the perspective of primary and secondary school teachers. Employing a qualitative descriptive methodology, semi-structured interviews were conducted with a sample of 22 teachers across six state-funded schools in Andalusia, Spain. The findings indicate that academic performance is significantly influenced by a complex interplay of factors, including classroom climate, family context, and teaching methodologies. Notably, teachers perceive student attitudes not merely as a correlation of success, but as a direct causal factor, often more critical than innate cognitive ability. They also identify a pressing need for professional development focused on pedagogical and emotional strategies to actively address disruptive and negative attitudes. This study underscores the importance of teacher training in fostering positive student dispositions, offering a framework for analyzing and intervening in the affective dimension of mathematics education.

Keywords: attitudes towards mathematics, academic performance, teacher perspective, mathematics education, affective factors

INTRODUCTION

The issue of academic performance in mathematics is not a regional matter, but a constant global problem that challenges education systems worldwide (Wu, 2025). In the Spanish context, this concern is heightened during the transition between primary and secondary education, a stage where international reports like program for international student assessment (PISA) show significant room for improvement, especially in regions such as Andalusia. For over a decade, research has pointed to the existence of a significant and direct relationship between the affective dimension of students and their performance in mathematics (Mato & de la Torre, 2009; Mato-Vázquez, 2010). This conclusion not only remains valid but has been reinforced and nuanced by recent international studies confirming that attitudes are a predictive factor for academic success (Alemany-Arrebola et al., 2025; Mohammadpour & Yon, 2024). The evidence is clear: a negative attitude towards mathematics, as de Guzmán (2007) argued, often leads

to low performance, a phenomenon that current research continues to corroborate (Akpalu et al., 2025).

In this complex scenario, the teacher emerges as a central figure. European Commission (2005) already highlighted their essential role in supporting learning, and today we understand that their socio-emotional competencies and pedagogical beliefs are decisive in forging a positive classroom climate (Arciniegas-Romero et al., 2025). Therefore, methodological renewal and teacher professional development are not mere options but an imperative necessity to positively influence student attitudes (García et al., 2019; Luzano, 2025).

While academic literature has robustly established that a significant correlation exists between student attitudes and their performance, much of this evidence is quantitative, leaving a gap in understanding how this relationship is constructed, manifested, and managed in the daily reality of the classroom.

The central problem this study addresses is, therefore, the need to explore the qualitative dimension of this phenomenon from the perspective of the actors

Contribution to the literature

- This study identifies a specific 'methodological shock' within the Andalusian educational context.
- The results highlight a significant gap between the integrated, game-based approach prevalent in primary school and the abstract, departmentalized logic of secondary education.
- From the teachers' discourse, a conceptualization of 'attitude' emerges that is eminently practical and observable.

who experience it firsthand: the teachers. It seeks to understand how they interpret and make sense of their students' attitudes and the impact these have on the learning process.

THEORETICAL BACKGROUND

In scientific literature, the attitudinal dimension has received considerable attention, although a lack of consensus on the precise definition of the construct 'attitude' persists (Yáñez & Villardón, 2016), a debate that remains current in research today (Aquilina et al., 2025). Despite this, it is recognized as an essential psychological aspect in mathematics education (del Socorro García González & Juárez López, 2011). In this sense, a critical shortcoming in earlier literature is the lack of differentiation between 'attitude' and overlapping constructs. Following Aquilina et al. (2025), we clarify that beliefs are cognitive based (the student's 'truth' about math), while motivation is conative (the 'will' to act). Attitude, however, is the stable affective-evaluative response that bridges belief and action.

One of the most complete conceptualizations is proposed by Alonso et al. (2004), who describe attitude as a construct of four components: the cognitive (what we know and believe), the affective (how we feel), the behavioral (what we do), and the conative (our intentions). Within this framework, the distinction made by Gómez-Chacón (2000) between mathematical attitudes, which are cognitive and linked to mental abilities, and attitudes *towards* mathematics, which are the focus of this study, is necessary. The latter refer to the valuation, appreciation, and interest in the discipline, giving preponderant weight to the affective component. They manifest in feelings of pleasure or displeasure (Martínez Padrón, 2008) and in behaviors such as satisfaction, curiosity, or appreciation (Gómez-Chacón, 2000).

Attitudes do not originate in a vacuum but are shaped by both endogenous and exogenous factors (Gamboa & Moreira-Mora, 2016). Contemporary research underscores how these are decisively influenced by the family context, through the beliefs and attitudes of parents (Barraza et al., 2016; Peixoto et al., 2024), as well as by teaching practice, which transmits the teacher's own conceptions through their teaching methodologies (Haataja et al., 2024; Ursini & Sánchez, 2019). Beyond methodology, the interpersonal dynamics between teacher and student, and the role of social

support systems like peer-assisted learning, have been shown to significantly moderate the link between these affective dimensions and final performance (Asare, 2025).

Therefore, the development of positive attitudes has become a primary educational objective (Fernández Cézár et al., 2016). Fostering positive emotions is key, as the cognitive and affective maintain a close relationship of interdependence (del Barco, 2008; Granello et al., 2025). A teacher can generate motivation as well as anxiety, insecurity, or rejection (Mato & de la Torre, 2009). Crucially, mathematics anxiety is a paralyzing emotional symptom of a negative attitude, often triggered when a student's self-efficacy fails in the face of perceived difficulty (Nyirabuhoro & Maringe, 2025). In this sense, the perception of mathematics as a 'difficult' subject can trigger a vicious cycle of difficulties, boredom, and demotivation (Hidalgo et al., 2004), making the study of student attitudes essential.

Academic performance, traditionally defined as the level of knowledge demonstrated in an area (Edel, 2003) and measured through grades (Barbera et al., 2012), is a phenomenon that cannot be understood solely from a cognitive perspective. As Erazo-Hurtado and Aldana-Bermúdez (2015) point out, ignoring subjective and social factors would lead to a limited view. Therefore, current research advocates for a multidimensional vision that considers an ecosystem of variables, including the student's context, family influence, study habits, and, prominently, the student's self-concept and motivation (Prada et al., 2020; Ulum, 2025).

Within this framework, the relationship between attitudes towards mathematics and academic performance has been one of the most studied. It is recognized that attitudes constitute an essential aspect for understanding academic achievements (Hassidov, 2019), and research has consistently shown a significant and direct correlation between the affective aspects of students and their performance (Alemany-Arrebola et al., 2025; Giné & Deulofeu, 2015; Mato & de la Torre, 2009).

Self-efficacy has established itself as a relevant predictor of performance (Alemany Arrebola & Lara, 2010), a finding that contemporary research continues to explore in depth (Street et al., 2024). Specifically, recent evidence highlights that mathematics self-efficacy functions as a central mediator, explaining how socio-constructivist environments influence achievement

(Akendita et al., 2024). Furthermore, the cognitive domain of mathematics has been identified as a key intermediary that bridges the gap between a student's belief in their ability and their actual level of achievement (Al Umairi, 2024).

Studies such as those by Cupani and Aparicio (2012) already confirmed that students with better performance are those who show greater optimism about their abilities, an idea that is reinforced by observing how self-concept and causal attributions correlate with grades from primary education onwards (Molera Botella, 2012).

The teacher's educational practice is another factor of enormous influence. The teaching method not only impacts the understanding of concepts (Küçükalioglu & Tuluk, 2021) but can be decisive in student performance (Prada et al., 2020). Within this scope, pedagogical frameworks like realistic mathematics education emphasize that the application of context-rich methods directly enhances achievement, especially when mediated by the teacher's professional self-efficacy (Akosah et al., 2024). In fact, some authors argue that low performance is often not due to the abstract nature of the subject, but to the teaching practices employed (Santaolalla Pascual, 2009). This underscores the importance of developing quality pedagogies that are culturally responsive and innovative (Luzano, 2025).

The family and socioeconomic context also plays a decisive role. Literature has consistently shown that family structure and climate correlate positively with academic success (Fajardo et al., 2017; Martínez Padrón, 2008). More specifically, parents' attitudes and beliefs about mathematics are a major factor influencing their children's motivation and achievement (Peixoto et al., 2024). Likewise, socioeconomic status is a significant predictor of both attitudes and performance, especially in disadvantaged school contexts (Givord, 2020; Mohammadpour & Yon, 2024).

Finally, negative attitudes, such as mathematics anxiety, act as a direct barrier to learning, generating feelings of fear and tension that diminish the student's capacity (Nyirabuhoro & Maringe, 2025; Villamizar Acevedo et al., 2020). This phenomenon is especially critical during the transition from primary to secondary education, a stage in which, as identified by Hidalgo et al. (2013), negative beliefs tend to be reinforced, and where a significant percentage of students experience adverse consequences in their academic trajectory due to demotivation and methodological changes (Monarca et al., 2012).

The main objective of this study is to understand how teachers interpret and make sense of their students' attitudes and the impact these have on the learning process. To achieve this purpose, the following specific objectives were established:

(1) to characterize the practical definition that teachers construct of 'attitude towards

mathematics', identifying the observable components (behavioral and emotional) they use to evaluate it daily;

(2) to identify and analyze, from the teachers' perception, the key factors they consider decisive in the formation of a positive attitude, including aspects of self-efficacy, relevance of the subject, work habits, and classroom climate; and

(3) to analyze the nature of the relationship that teachers establish between attitude and academic performance, exploring the magnitude and causality they attribute to it in the success or failure of students.

METHOD

This study employed a qualitative approach within an interpretative-constructivist paradigm (Guba & Lincoln, 1994). This paradigm was selected as it allows for the exploration of multiple subjective realities as constructed by those experiencing the educational phenomenon firsthand: the teachers. This methodology is particularly suitable for exploring in depth the perceptions and experiences of the participants, aiming for a detailed phenomenological account. Within this framework, a qualitative-descriptive design was applied, using semi-structured interviews for data collection and content analysis for their interpretation (López-Noguero, 2002).

Research Context: Mathematics Performance in Spain and Andalusia

To contextualize the urgency of this study, it is necessary to observe the landscape of academic performance in Spain. The results of the OECD's (2020) PISA have historically shown unsatisfactory and stagnant performance in mathematical competence. The most recent data from PISA 2022 confirm this trend, placing Spain with 473 points, right at the OECD (2020) average (472), but once again highlighting significant disparities among its autonomous communities (Ministerio de Educación, Formación Profesional y Deportes, 2023).

In this framework, the situation in Andalusia, the region where this research was conducted, is particularly concerning. With a score of 457 in mathematics, it is notably below the national and OECD (2020) averages, ranking among the lowest in the country. This persistent performance gap is not merely a statistical fact but a reflection of a complex structural problem, influenced by a decentralized education system where the autonomy of schools to innovate pedagogically is often limited (OECD, 2020).

It is in this context that student attitudes and teaching practice acquire critical relevance, justifying the need to explore in depth the qualitative factors presented here.

Table 1. Demographic characteristics of the participants

Code	School	Teaching level	Years of experience	Role
P1	Primary school A	5 th & 6 th primary	15-20	Teacher
P2	Primary school A	6 th primary	10-15	Teacher
P3	Primary school A	5 th primary	5-10	Teacher
P4	Primary school B	5 th & 6 th primary	10-15	Teacher
P5	Primary school B	6 th primary	5-10	Teacher
P6	Primary school B	5 th primary	15-20	Teacher
P7	Secondary school C	1 st & 2 nd secondary	10-15	Teacher
P8	Secondary school C	1 st secondary	1-5	Teacher
P9	Secondary school C	1 st & 2 nd secondary	1-5	Teacher
P10	Secondary school C	1 st & 2 nd secondary	20-25	Teacher
P11	Secondary school C	1 st & 2 nd secondary	25-35	Head of department
P12	Secondary school C	1 st secondary	1-5	Teacher
P13	Secondary school D	1 st secondary	1-5	Teacher
P14	Secondary school D	1 st & 2 nd secondary	10-15	Teacher
P15	Secondary school D	1 st & 2 nd secondary	1-5	Teacher
P16	Secondary school E	1 st secondary	5-10	Teacher
P17	Secondary school E	1 st & 2 nd secondary	15-20	Principal
P18	Secondary school E	2 nd secondary	5-10	Teacher
P19	Secondary school E	1 st secondary	10-15	Teacher
P20	Secondary school F	1 st & 2 nd secondary	10-15	Teacher
P21	Secondary school F	1 st secondary	10-15	Teacher
P22	Secondary school F	1 st & 2 nd secondary	10-15	Teacher

Participants

The study sample consisted of 22 mathematics teachers from the autonomous community of Andalusia, Spain. Participants were selected through non-probabilistic purposive and convenience sampling (López-Noguerro, 2002), specifically identifying professionals from 11 distinct educational centers (including both primary and secondary schools) to ensure a diverse representation of the regional context.

The inclusion criteria required that teachers were actively teaching in either the final years of primary education (5th grade and 6th grade) or the initial years of compulsory secondary education (1st grade and 2nd grade). This specific focus was designed to capture the perceptions of those frontline actors directly involved in the critical transition stage between educational levels. Recruitment was conducted through institutional contact with school management teams; notably, all invited professionals agreed to participate (non-participation rate: 0%).

The final sample size of $N = 22$ was determined following the principle of thematic saturation (Glaser & Strauss, 1967). The research team reached 'thematic saturation' by the 20th interview, as subsequent data collection sessions yielded no new conceptual codes, variations in categories, or additional insights into the phenomenon under study.

The participant group was composed of 20 classroom teachers, one school principal, and one head of a mathematics department, the latter having direct involvement in the coordination of the transition process. The professional experience of the sample was

notably diverse, spanning a range from 1 to 35 years of service, which provided a comprehensive longitudinal perspective on student attitudes. Detailed profiles of each participant are presented in **Table 1**.

Instrument

The main instrument for data collection was a semi-structured interview, designed *ad hoc* for this research to explore teachers' perceptions in depth. To ensure the content validity of the instrument, the interview script underwent a rigorous validation process using the expert judgment technique. This panel consisted of five experts: two university researchers specializing in mathematics education, two active school counselors, and one senior teacher-trainer from a regional Teacher Training Center. Following a two-round, Delphi-like process, the experts evaluated the clarity, relevance, and categorical alignment of the questions. Their suggestions were incorporated into the final version of the script, refining 15% of the original questions for categorical accuracy. The interview protocol is provided in **Appendix A**.

The interviews were conducted in person and individually by members of the research team, who were previously trained to minimize interviewer bias. Each session lasted between 20 and 45 minutes and was audio-recorded with the prior informed consent of the participants. This ensured a literal and faithful transcription of the teachers' discourse, which served as the raw data for the subsequent content analysis.

To safeguard the qualitative rigor and reliability of the data analysis process, 25% of the transcripts ($N = 6$)

Table 2. Main categories of analysis used in the study

Main category	Description of analyzed content
1. Conceptualization of attitude	Teachers' perceptions of the definition, components, and observable manifestations of attitude.
2. Configuring factors	Analysis of the elements that, according to teachers, influence the formation of attitudes (internal and external).
3. Influence on performance	Perception of the nature, magnitude, and impact of the relationship between attitudes and academic performance.
4. Typology of attitudes	Identification and description of specific attitudes that teachers associate with different student profiles.

Table 3. Main thematic categories and frequency of appearance in teacher discourse (n = 22)

Category/thematic code	Frequency	Percentage (%)	Key descriptor (teacher perception)
Perceived self-efficacy	19	86.4	Core internal driver; resilience vs. initial fear.
Math anxiety/frustration	18	81.8	The 'emotional block' triggered by abstract tasks.
Classroom climate	17	77.3	Pedagogical environment and safety for error.
Family & socioeconomic context	14	63.6	External background and inherited beliefs.
Methodological transition gap	16	72.7	The 'shock' reported by secondary teachers.

were independently coded by two researchers using the initial category system. We achieved a high inter-coder agreement, with a Cohen's kappa of 0.82. Any minor discrepancies in coding were resolved through consensus meetings and peer-debriefing sessions until a unified and robust coding system was established (detailed in [Appendix B](#)).

Data Analysis

After the literal transcription of all interviews, the textual data were subjected to a rigorous content analysis, following the methodological framework for qualitative analysis proposed by Miles and Huberman (1994). The process was developed in several phases, combining a deductive and inductive approach for the construction of the category system. For the management, organization, and systematization of this coding process, the qualitative data analysis software MAXQDA-24 was used. The main categories that guided the interpretation of the results are presented in [Table 2](#). Complete and detailed coding system, with all subcodes and their descriptions, is available in [Appendix B](#).

Ethical Considerations

During the study, participants completed an informed consent form in which they were guaranteed the confidentiality and anonymity of their personal data in accordance with the guidelines established in organic law 3/2018 on the protection of personal data and guarantee of digital rights. Throughout the process of transcription, coding, and analysis of the interviews, the anonymity of the teachers was preserved by assigning identification codes.

RESULTS

The analysis of the teachers' discourse has allowed us to construct a methodical portrait of their perceptions of

attitudes towards mathematics. The findings reveal a unanimous consensus: 100% of the interviewed teachers (N = 22) perceive student attitudes not as a mere correlation but as a direct causal link to academic success or failure. The results are presented below, structured according to the four general categories that emerged from the content analysis: the conceptualization of attitude, the factors that configure it, its influence on academic performance, and the typology of attitudes observed in the classroom.

Across these categories, the content analysis identified 'perceived self-efficacy' as the most frequent thematic factor (mentioned by 19 out of 22 participants, 86%), followed by 'classroom climate' (n = 17, 77%) and the 'family and socioeconomic context' (n = 14, 64%).

The qualitative analysis allowed for the identification of five core thematic categories, which are presented in [Table 3](#) along with their frequency of appearance in the teachers' discourse. This quantitative overview provides a technical foundation for the in-depth categorical analysis that follows.

The Conceptualization of Attitude From the Teacher's Perspective

For the teachers interviewed, attitude is an eminently practical construct: the disposition with which a student confronts mathematics. This view integrates two key dimensions. On the one hand, an affective and internal component, described as 'a feeling that leads to discovering new things' or intrinsic motivation. On the other, and more prominently, a behavioral and observable component, which manifests in effort, initiative, and the ability to tackle new problems.

"I understand attitude as the way of facing different problems, in this case, learning problems, how one faces their own process and if they make an effort when trying to solve a

problem, if they make an effort when trying to understand or reflect on what is being explained, or if they are simply a passive subject who pays attention to the teacher's explanations to then try it at home" (P9).

This practical view is also shared in primary education, where attitude is linked to discovery:

"I see it as that sparkle in their eyes; a positive attitude is when they ask 'what if we try this?' instead of just waiting for the rule" (P4).

A contrastive analysis reveals significant nuances in this conceptualization across educational levels. Primary teachers (n = 6) tend to describe attitudes as 'fluctuating and external', often tied to the student's desire to participate in classroom games. In contrast, secondary teachers (n = 16) perceive attitudes as a more 'fixed and internal' state, which once crystallized as negative, becomes a resilient barrier to learning.

The Ecosystem of Attitude: Determining Factors According to Teachers

The interviewed teachers do not perceive attitudes as fixed or innate traits, but as the result of a dynamic ecosystem of interrelated factors. From their discourse emerges a model in which the student's beliefs, emotions, and habits interact to forge their disposition towards mathematics.

The essential pillar of this ecosystem is the student's perceived self-efficacy (n = 19, 86%). Teachers consider it indispensable that the student 'feels capable' and starts from a positive mindset, free from preconceived frustration. This belief is not limited to initial confidence but manifests, essentially, in resilience in the face of difficulty, an aspect they consider inherent to mathematical work. As one teacher articulates, success does not lie in getting it right the first time, but in the will to persevere:

"Simply what they must have, I think, is a desire to learn; a desire in the sense that they must want to make an effort. In mathematics, it's not enough to read a problem and see the solution. One has to try different paths, look for different strategies and, above all, not get frustrated at the first attempt. It's rare for a problem to be solved on the first try, but problems do get solved. What you have to do is try a lot" (P10).

At the secondary stage, this resilience is viewed as the antidote to what teachers call the 'frustration wall' (n = 18, 81.8%). As P21 noted:

"Problems are basically that they feel frustrated in the face of failure ... one cannot resolve that by explaining the same thing 20 times. We must teach

the child to manage frustration, to learn from the error not to feel worse, but to feel that they have a path" (P21).

The affective dimension crystallizes in motivation, which, according to teachers, is significantly activated when students manage to connect the discipline with a purpose. This connection can be the perception of utility ('what is this for?') or the presentation of the task as a playful challenge. Self-esteem was also pointed out as a critical factor, as students with low self-esteem often have greater difficulties in facing the subject with confidence:

"More than anything, that they see its usefulness; if they don't see its usefulness, it doesn't go well for them. They, for example, say: 'Why don't we do this game to solve it?' When they take it as a game, it goes well for them ..." (P1).

Furthermore, the family and social context (n = 14, 63.6%) is perceived as the primary source of inherited beliefs. Teachers observe that a student's predisposition is often a 'echo' of their parents' own math anxiety or expectations, which can either act as a bridge or a barrier to school success. This external influence often shapes the student's initial approach to the subject even before they enter the classroom.

Finally, this ecosystem is completed with work habits and behaviors. Teachers allude to a capacity that transcends the mere completion of tasks: constancy, discipline, and, above all, the ability to 'organize their ideas,' a metacognitive skill they consider essential for mathematical thinking. Attention in class, active curiosity, and participation through questions are seen as the behavioral manifestation of a positive attitude:

"Having a good capacity for work, that is very important, which we often find lacking because they don't have the capacity for work, to organize their ideas, which is a very important thing in mathematics" (P11).

In this complex network, teachers also recognize their own role as a key exogenous factor (n = 17, 77.3%), highlighting the importance of creating 'pleasant, attractive, and exciting' classes to foster a favorable disposition in students.

The Role of Attitudes in Academic Performance in Mathematics

The most resounding and revealing consensus of the study is the teachers' perception of the nature of the relationship between attitude and performance. They describe it not as a simple correlation, but as a causal, direct, and enormously significant link, which they often consider more decisive than the student's own cognitive

ability. Most of the interviewees rated this influence as 'high' or 'very high,' and some even defined it as 'total.'

"Total, total. A curious, motivated student, etc., you have a guarantee of certain success, even if they are not good at mathematics; but the student who has those attitudes will never have problems in mathematics" (P7).

The nature of this influence shifts noticeably between settings. In primary education, the core of success is perceived to be linked to external motivation and 'playful challenges' (n = 6). However, in secondary education (n = 16), teachers highlight that 'frustration management' and the emotional capacity to handle abstract complexity are the real determinants of the final academic outcome.

Teachers explain this causal mechanism clearly: attitude is the engine that activates (or deactivates) the behaviors necessary for learning. A positive attitude, which manifests in motivation, interest, perseverance, and an open mindset, drives the student to try, not to give up in the face of obstacles, and to develop responsible study habits. Conversely, a negative attitude becomes a formidable barrier, especially in a subject like mathematics, often perceived as difficult.

"They are usually very directly related because the student who has the attitude, tries, whereas the one with a negative attitude, directly when they reach any obstacle, doesn't even try and says: 'I'm not continuing'" (P1).

Within the range of beneficial attitudes, teachers especially highlight participation in class. The willingness to ask questions is seen not only as a strategy to resolve doubts but as the ultimate expression of a real commitment to learning and a brave attitude that does not fear error.

"I think an attitude of participating in class is fundamental, that they don't just sit there like a piece of furniture, but participate [...], do, ask, that's another necessary attitude too [...] The attitude of asking is a good attitude, it means I want to, even if I can't help myself, and that's good ..." (P4).

While most teachers defend this direct relationship, some qualify that, although attitude is a key factor, it is not the only determinant, and that innate abilities also play a role in the final academic outcome.

Typology of Attitudes in the Classroom: Behaviors Associated With Success and Failure

Delving into their experience, teachers drew two clearly contrasting attitudinal profiles, which they

directly associate with academic success and failure in the subject of mathematics.

On the one hand, they describe the successful student not only by their ability but by a set of proactive attitudes. This profile is characterized by intrinsic curiosity and a willingness to 'enjoy mathematics,' sometimes seeing it as a 'hobby' or a challenge to explore. This curiosity translates into brave participation in the classroom, where there is no fear of making mistakes. The willingness to ask questions is seen as one of the clearest signs of a positive attitude:

"Good students [...] participate, raise their hand, ask, make mistakes, pay attention, in short, a participative and active attitude" (P9).

Correspondingly, primary teachers emphasize the role of play in this success:

"Success in primary starts with curiosity; they don't mind getting it wrong if they perceive the math as a puzzle they want to solve" (P2).

This commitment is complemented by a consistent work ethic, which includes discipline, organization, constancy, and a methodical approach to dealing with problems. Ultimately, this profile is based on a general attitude of respect, responsibility, and acceptance of the subject, facing difficulties with a positive disposition.

At the opposite extreme, the profile of the student with difficulties is marked by a general attitude of rejection towards the subject. This attitude, which teachers often perceive as being reinforced by the family environment, manifests in a lack of effort, interest, and, critically, in a deep fear of error and failure. This fear paralyzes the student, who avoids asking questions out of embarrassment or fear being negatively evaluated by their peers or even their parents:

"Well, the rejection of the subject, or they think it's very difficult and they can't; not asking in class and not participating; not working enough on the concepts we see in class, not doing the tasks by solving the problems that are set to consolidate knowledge. The lack of constancy and perseverance, as I said before ... that ..." (P11).

The early roots of this rejection are noted by primary educators:

"The rejection often starts early, when they feel that math is a world they don't belong to, often reinforced by hearing at home that 'math is only for some kids'" (P3).

This profile is completed by a lack of organization and responsibility and often leads to feelings of frustration and a perception of inability, creating a

vicious cycle from which the student finds it very difficult to escape.

Secondary teachers emphasize that the profile of the student with difficulties is characterized by an emotional 'frustration wall' that effectively blocks logical reasoning, a phenomenon less common in primary school, where the perception of difficulty is still mediated by the teacher's immediate support.

DISCUSSION

The results of this study, based on the direct experience of teachers, not only confirm the consistent relationship between attitudes and academic performance documented in the literature (Alemany-Arrebola et al., 2025; Mato & de la Torre, 2009) but, decisively, allow for an understanding of the qualitative mechanisms underlying this connection. The teacher's perspective provides a phenomenological depth that complements and adds nuances to the existing quantitative evidence.

A unique contribution of this study is the identification of a specific 'methodological shock' within the Andalusian educational context. The results highlight a significant gap between the integrated, game-based approach prevalent in primary school and the abstract, departmentalized logic of secondary education. This shift appears as a triggering factor for negative attitudes and mathematics anxiety in this regional context, acting as a 'frustration wall' that blocks logical reasoning precisely at the transition stage

From the teachers' discourse, a conceptualization of 'attitude' emerges that is eminently practical and observable. While academic literature debates a unified definition (Aquilina et al., 2025; Yáñez & Villardón, 2016), teachers use a clear functional model that integrates the student's internal disposition (motivation and curiosity) with their classroom behaviors (effort and participation). This functional distinction resonates with the contemporary need to bridge theoretical constructs with tangible classroom realities (Aquilina et al., 2025), suggesting that for frontline professionals, attitude is a quantifiable state evaluated through daily persistence.

Likewise, the study refers to the perception of an 'ecosystem' of factors that shape these attitudes. The fundamental importance that teachers give to the student's self-efficacy ('feeling capable,' 'not getting frustrated at the first attempt') is the classroom manifestation of what theoretical research has identified as a primary predictor of performance (Alemany Arrebola & Lara, 2010; Street et al., 2024). This observation by Andalusian teachers aligns with the cognitive-affective model of Al Umairi (2024). By identifying self-efficacy as a precursor to the cognitive domain, we can understand why our participants view attitude as more critical than innate ability: a proactive disposition is the key that 'unlocks' the cognitive

functioning necessary for mathematical learning. Similarly, the teachers' concern about the impact of the family environment is consistent with evidence confirming the strong correlation between parental attitudes and student motivation (Barraza et al., 2016; Peixoto et al., 2024). This work, therefore, not only validates these constructs but shows how teachers identify and experience them as part of a network of interconnected influences.

One of the most significant observations is the unanimous perception of teachers about the causal nature of the attitude-performance relationship. While quantitative studies establish correlations (Hassidov, 2019; Mello & Hernández, 2019), the qualitative perspective of Andalusian teachers suggests a direct causal mechanism: attitude is not just an associated factor, but the specific agent that facilitates or inhibits learning behaviors. As one participant aptly articulated: 'the student who has attitude,' tries a phrase that encapsulates the link between motivation and success (Cupani & Aparicio, 2012).

By connecting these observations with the problem posed in the introduction, a main conclusion emerges: there is a significant gap between the deep awareness that teachers have about the importance of attitudes and their perception of feeling insufficiently prepared to manage them. Their intuition about the need to create 'pleasant and exciting' classes is an implicit demand for the application of quality pedagogical practices that the literature recommends (García-Pérez & Peñaloza, 2025; Luzano, 2025). Indeed, as Asare (2025) suggests, the teacher-student relationship and peer-assisted learning act as moderating buffers that can prevent negative attitudes from turning into academic failure during the critical transition period. This underscores that teacher training in socio-emotional competencies (Arciniegas-Romero et al., 2025) is the fundamental element for improving student performance and mitigating the methodological shock identified in the transition process.

The qualitative evidence points towards a bifocal crisis: an internal ecosystem of self-efficacy and resilience that clashes with an external shift in pedagogical logic. **Figure 1** conceptualizes this 'methodological shock', illustrating how the transition from the holistic logic of primary education to the departmental abstractness of secondary education triggers a 'frustration wall' that blocks further cognitive engagement.

CONCLUSIONS

This study confirms, from the experiential perspective of teachers, that student attitudes are a determining and direct factor in academic performance in mathematics, often perceived as more influential than cognitive aptitude. Teachers identify a complex

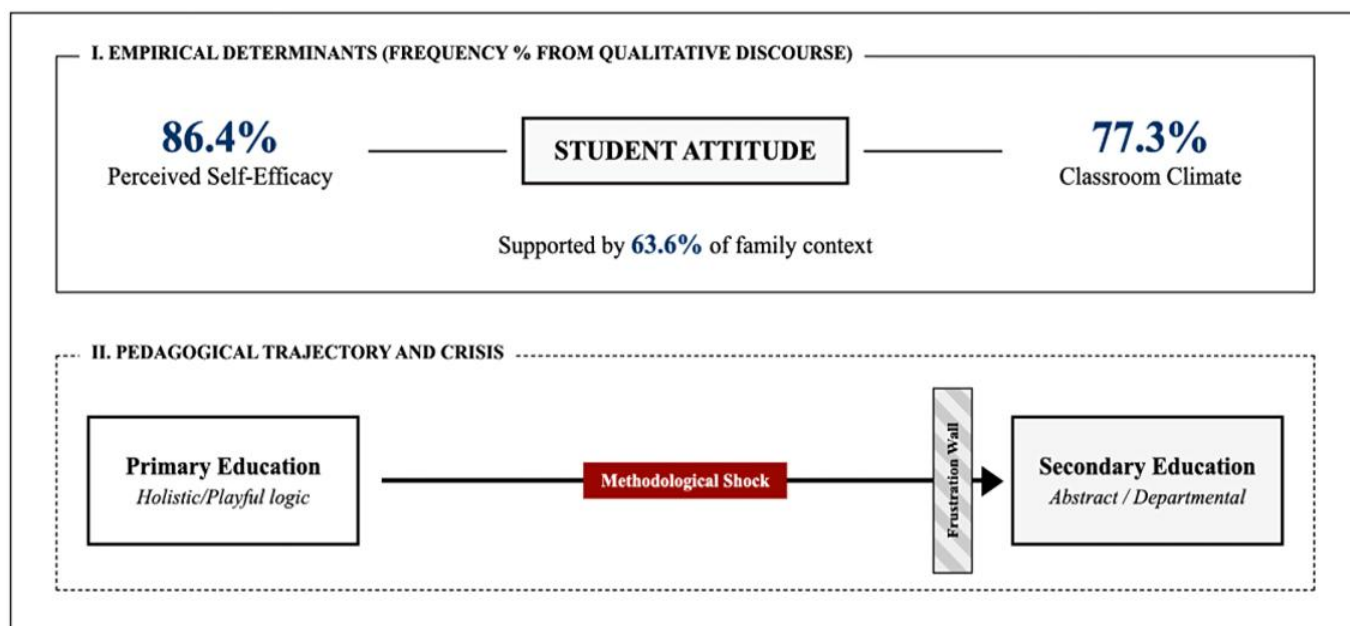


Figure 1. Conceptual model of attitude dynamics (Source: Author’s own elaboration)

ecosystem where the student’s beliefs, their emotional response, and the family and school contexts interact to forge a positive or negative attitude. Within this interconnected system, teachers observe in their daily practice how an attitude of rejection, anxiety, or apathy can neutralize a student’s intellectual potential, whereas a positive and proactive disposition can catapult the success of students with more modest initial abilities.

Consequently, the most pressing need that emerges from this work is the reorientation of teacher training. It is imperative to transcend purely curricular approaches to equip teachers with pedagogical and emotional strategies, enabling them to identify, understand, and transform negative dispositions within the classroom.

Ultimately, this research contends that fostering a positive disposition towards mathematics is not merely a desirable goal, but a *sine qua non* for ensuring meaningful and equitable learning for all students.

Limitations and Future Lines of Research

The inherent limitations of this study are acknowledged. Its qualitative nature and its sample, although diverse in experience, are geographically located in a single region, which requires caution in generalizing the results. Furthermore, the research is based exclusively on the teacher’s perspective. Future research would benefit from a mixed-methods design that integrates the voice of students and their families to obtain a more complete understanding of the phenomenon. Likewise, longitudinal studies are suggested to analyze the evolution of these attitudes throughout critical stages, such as the transition from primary to secondary education.

Pedagogical Implications

The conclusions of this study have direct implications for the improvement of educational practice. Firstly, and as a starting point, it highlights the need to reorient teacher training, both initial and continuous, to transcend the purely didactic approach. Such a shift requires the integration of compulsory modules on 'Mathematics Emotional Management' into initial teacher education, providing specific tools to identify math anxiety and cultivate student resilience from the very beginning of the professional career.

Moreover, addressing the identified 'methodological shock' necessitates focused policy changes tailored to the regional reality. Such measures should include recalibrating curriculum density during the first semester of Secondary school to mitigate the specific performance dip identified in the Andalusian PISA 2022 results. This would allow teachers to prioritize emotional bonding and the normalization of error over content speed during the critical transition weeks. Likewise, institutionalizing mandatory 'transition-bridge' meetings between Primary schools and their affiliated Secondary centers is imperative to harmonise pedagogical expectations, ensure methodological continuity, and establish common attitudinal strategies.

Consequently, this training must translate into the application of renewed pedagogical practices in the classroom. It is recommended that active teachers design learning experiences that connect mathematics with the students' reality, demonstrating its practical utility and promoting a playful approach that transforms the perception of the subject. Complementary and inseparable from this work, it is essential to deliberately cultivate a safe classroom climate, where error is normalized as an intrinsic part of the learning process.

Finally, this dual capacity, pedagogical and emotional, places teachers in an ideal position to also act as agents of early diagnosis. By being trained to identify their students' attitudes, teachers can detect risk signals and carry out focused tutorial interventions before low performance becomes entrenched.

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APPENDIX A

Table A1. Semi-structured interview protocol

Target category	Selected interview questions (guiding the discourse)
Conceptualization of attitude	Define or describe what you understand by the term 'attitude.' Specify the types of attitudes you believe a student can manifest toward mathematics.
Configuring factors	What cognitive aspects (beliefs and expectations) must a student have to manifest a good attitude? What affective aspects (feelings and emotions) are necessary for a positive disposition? What behavioral aspects (study habits and organization) characterize a good attitude? What strategies do you apply to manage attitudes related to 'anxiety, denial, or frustration'? How do you promote changes in attitudes related to the perception of mathematical utility? Describe a situation (including family/contextual factors) where a student manifested a bad attitude.
Influence on performance	What degree of influence do you believe attitudes have on academic performance? Why? How can the teacher's intervention impact attitudes to achieve better academic results? Do you feel sufficiently trained to intentionally change student attitudes?
Typology of attitudes	Describe the attitudinal profile (success-oriented) of students with high performance. Describe the attitudinal profile (rejection-oriented) of students with low performance.

APPENDIX B

Table B1. Category and code system

Category	Codes used in the analysis	Description of the analyzed content
1. Conceptualization of attitude	1.1. Functional disposition	Perception of attitude as effort, initiative, and a proactive stance toward problem-solving.
	1.2. Affective dimension	Intrinsic state described as curiosity, pleasure, or attraction toward mathematical discovery.
2. Configuring factors	2.1. Perceived self-efficacy	The student's belief in their own capability; the cornerstone of mathematical resilience.
	2.2. Frustration management	The emotional capacity to handle error and persistence in the face of difficulty (the 'frustration wall').
	2.3. Motivation and utility	The perception of mathematics as a useful and purposeful tool for the student's reality.
	2.4. Teacher's role and climate	Impact of teaching methodologies and the creation of an emotionally safe classroom environment.
	2.5. Family and social context	External influence of parental beliefs, expectations, and socioeconomic background.
	2.6. Metacognitive habits	Observable behaviors such as organization of ideas, attention, and study consistency.
3. Influence on performance	3.1. Causal nature of influence	Perception of attitude as the direct engine that activates or inhibits cognitive processes.
	3.2. Attitudinal barrier	Negative attitude as a formidable block that prevents the understanding of abstract concepts.
4. Typology of attitudes	4.1. Proactive success profile	Characteristics of students who enjoy mathematics, participate bravely, and do not fear error.
	4.2. Passive/rejection profile	Behaviors associated with failure: math anxiety, learned helplessness, and apathy.

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